

Tape Punch

TPU 610121

The FACIT PE 1500

A SHORT TECHNICAL DESCRIPTION

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The FACIT PE 1500 high-speed tape punch is specially designed to work on the output side of electronic data processing machines or as terminal equipment on fast data transmission links. Because of its speed, reliability and compact construction, it also finds application in many other data registration systems.

Basic design

The FACIT PE 1500 is here used as number for all the types. Otherwise the types are designated as follows:

PE 1501 mechanical unit; single-phase, 220V, 50 cy/s, 100 W
PE 1502 mechanical unit; single-phase, 220V, 60 cy/s, 100 W
PE 1503 mechanical unit; single-phase, 115V, 50 cy/s, 100 W
PE 1504 mechanical unit; single-phase, 115V, 60 cy/s, 100 W
PE 1507 electronic unit; single-phase, 220V, 50 or 60cy/s, 80 W
PE 1508 electronic unit; single-phase, 115V, 50 or 60cy/s, 80 W

The mechanical and electronic units can be combined as follows:

PE 1501 can be connected to PE 1507 or PE 1508
PE 1502 can be connected to PE 1507 or PE 1508
PE 1503 and PE 1504 can not be connected to anyone of the electronic units.

The FACIT PE 1500 handles 5, 6, 7 or 8 channel tapes. The mechanical unit is adjustable to any of these widths. Paper format and hole spacing conforms to international standards.

The FACIT PE 1500 is completely transistorised and contains all circuitry for synchronization, paper feed, and punch drive.

A buffer register on the input side allows high exploitation of the system in which the punch is working.

Principle of
operation

FACIT PE 1500 is a motor-actuated punch. The punching operation is performed in a punchhead where the force is delivered by the motor and the selection of the punches is made by means of solenoids.

The motor also feeds the tape. An electromagnet puts the tape in contact with a papermoving gripper when tape advance is ordered.

Punch
mechanism

The punches are placed in sash A (fig. 1), which receives vertical reciprocating motion from an eccentric on motor shaft B.

At the top of the sash there is a bellcrank hammer, C, above each punch.

When the sash is up (eccenter in phase b), this hammer is in contact with stud D, and thus aligned with the punch F. If punching is not ordered, spring E deflects the hammer from the punch when the sash moves down (to phases c and d of the eccentric).

When punching is ordered, solenoid G is energized in phase interval a through c. As b is passed, the hammer is forced by stud D against the solenoid. The pull counteracts the force of spring E, which now cannot deflect the hammer from the punch. When the sash moves down, the hammer drives the punch through the tape on die H. Before the bottom center is reached (eccentric at d), stud I swings the hammer away from the solenoid and the punch (current through the solenoid has ceased a short time earlier). When the sash later moves up, it engages the head of the punch, withdrawing it.

Tape feed

Tape feed is effected by reciprocating gripper K coupled through connecting-rod L to the eccentric on the motor shaft. The gripper advances one character-spacing (2,54 mm

or 0,1") per stroke. The tape is pressed against the gripper surface by plate M, coupled to an armature common to electromagnets N and Q, when magnet Q is energized.

In idle condition magnet N holds, and the armature presses the tape against stationary brake Q.

The current shifts from magnet N to magnet Q at point a in the eccentric cycle, and the other way at point c. Tape advance is thus obtained from a to c if ordered from outside.

Electronic functions

The FACIT PE 1500 is started by a start pulse (fig. 2). If the motor is running, the machine is ready to punch within one revolution of the motor shaft (6,7 ms) from the leading edge of the start pulse. If not, the motor must first be started and accelerated to full speed. During the acceleration period (0,3 sec.), the electronic circuits are blocked. After punching, the motor keeps full speed another 5 seconds. If a new start pulse occurs during this time, punching will begin within 6,7 ms. .

The punch works asynchronously, i.e. completely independent of the start pulse timing. Synchronization is obtained through clock pulses generated when the motor shaft is in rotation.

Timed to the start pulse, information is fed to the electronic unit on 5, 6, 7 and 8 parallel channels, all with a common ground bus, either as DC levels (in which case a positive signal means "no punch" and a negative "punch"), or as negative pulses on the channels where punching is to occur. The electronic unit of the FACIT PE 1500 contains a buffer register (8-bit capacity) which accommodates information until it is punched.

On an outgoing line a "ready signal" is given (see fig. 2). The positive swing is generated upon gating of information

into the buffer register, the negative swing when the punching is finished. Between the swings, a new start pulse may not be fed to the unit.

Specifications

Tape

Width:	5 channel standard	17.5 mm	(11/16")
	6 " "	22.2 mm	(7/8")
	7 " "	22.2 mm	(7/8")
	8 " "	25.4 mm	(1")

Thickness: 0.08 mm

Character spacing: 2.54 mm (0,1")

Outer diameter of

Tape roll: 200 mm

Inner diameter of

Tape roll: 50 mm

Length: about 1000 ft. (300 m)
corresponding to about
120.000 characters

Electric data

Line voltage: see above "Basic design"

Number of signal-
lines:

10 plus common ground bus:
start pulse, "ready signal",
and 8 information lines.

Start pulse:

Negative 0,1 - 3 ms duration
Pos.voltage range: min + 1 V,
max + 25 V

Neg.voltage range: min - 4 V,
max - 25 V

Input impedance 5,000 ohms

Information lines:

5, 6, 7 or 8 parallel lines
with common ground

Mechanical
data:

	DC level, or neg.pulse of \leq 0,1 ms duration, concurrent with start pulse.
	Pos. voltage range: min + 1 V, max + 25 V. <u>No punch</u>
	Neg. voltage range: min - 4 V, max - 25 V. <u>Punch</u>
	Input impedance 5,000 ohms
"Ready signal"	From - 10 V to + 1 V after gating of information to buffer register; \leq 10 μ s rise time
	From + 1 V to - 10 V after punching; \leq 10 μ s fall time
	Output impedance 500 ohms
Buffer register:	Built-in, capacity one 5, 6, 7 or 8-bit character.
Punching speed:	Up to 150 characters (lines) per sec.
Paper feed:	Step by step, externally controlled
Maximum dimensions:	Mechanical unit: length: 516 mm width: 210 mm height: 218 mm Electronic unit: length: 522 mm width: 262 mm height: 180 mm
Weights:	Mechanical unit: 16,5 kg Electronic unit: 15 kg Punches and die of high alloy steel. Chad disposed of through outside plastic tube Boxes in enamel grey crackle

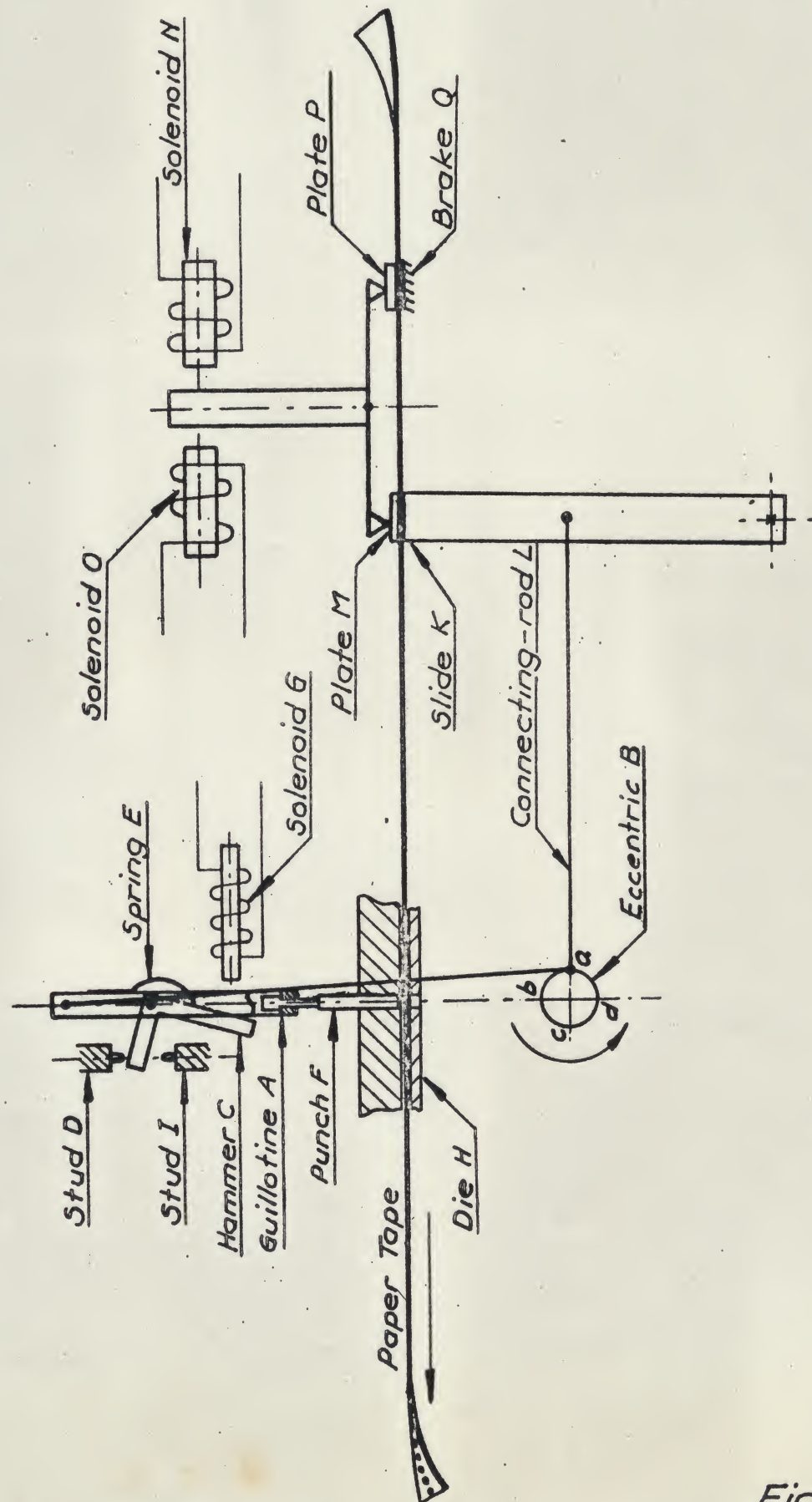


Fig. 1

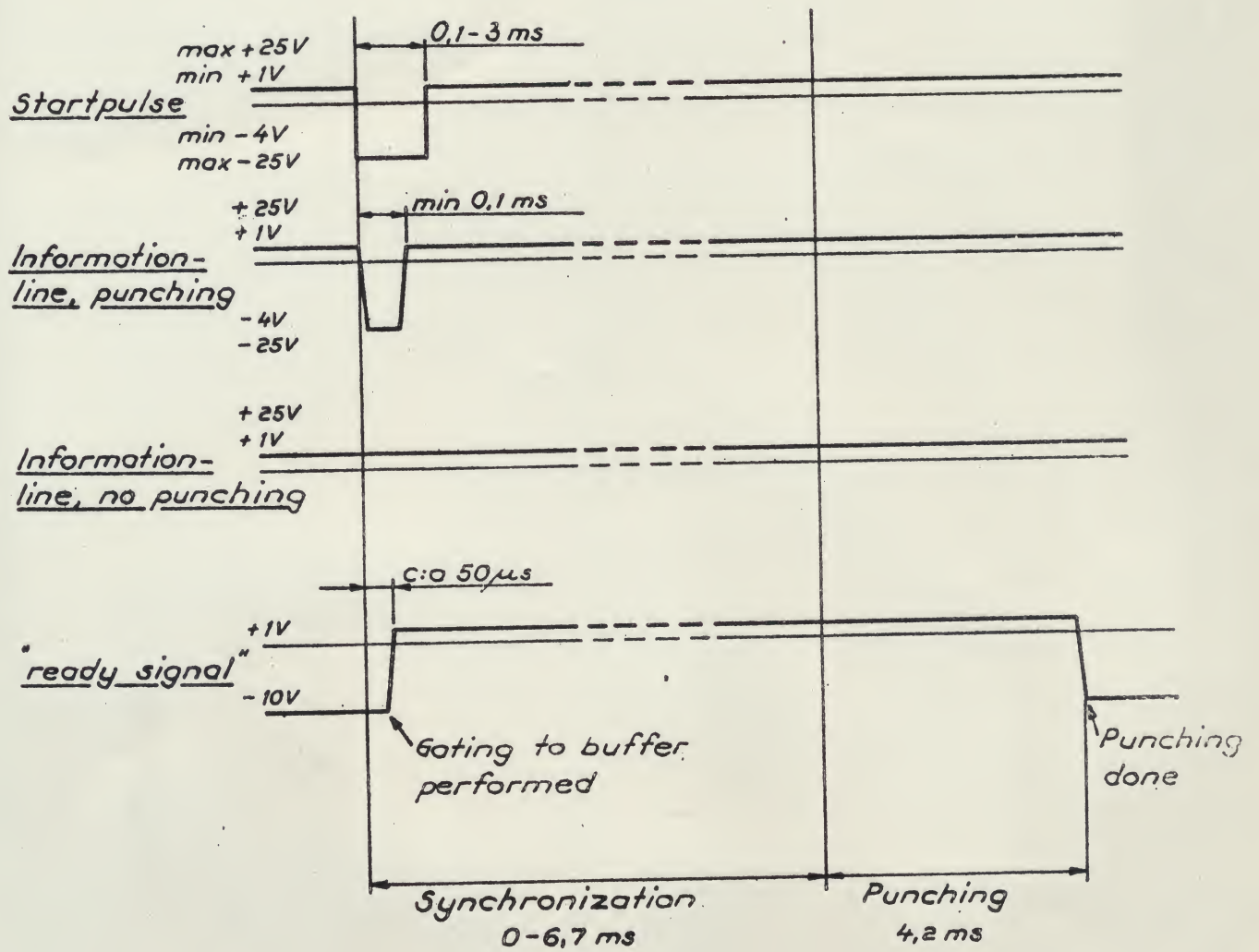


Fig. 2.

Eccentric
Position:

a	b	c	d	a
Tape moving left- words	Tape moving left- words	Slide returns Tape stationary	Slide returns Tape stationary	
No braking	No braking	Braking	Braking	
Guillotine moving up	Guillotine moving up	Guillotine moving down	Guillotine moving down	
Solenoid & not energized	Solenoid & attracts hammer	Solenoid & Solenoid attracts hammer not energized	Solenoid not energized	
Punch up	Punch up	Punch through paper	Punch returns	
Paper feed		Punching		Reset

Fig. 3